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International edition

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#### How to submit articles

The quality of the material we can publish in  
Dragon User each month will, to a very great  
extent, depend on the quality of the  
contributions that you can make with your  
Dragon. The Dragon computer was launched  
on to the market with a powerful version of  
Basic, but with very poor documentation.

Articles which are submitted to Dragon  
User for publication should not be more than  
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addressed envelope.

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## Editorial

MSX HAS BEEN the subject of considerable publicity in recent months. A host of well-known names such as Toshiba, Sanyo and Spectravision have pledged their support to the MSX standard which allows software written for one machine to run on all other MSX compatible machines. Software companies too have generally been in favour of the new standard, though most of them are still waiting to see how the machines actually sell.

In an attempt to gather more support to the MSX banner, the MSX working party organised a recent junket to the south of France to officially launch their range of meetings. Unfortunately, this trip was timed to coincide with the first day of the Personal Computer World show, a clash which should not have been difficult to avoid.

Those people opposed to MSX cite its 280, 8-bit, processor as being old-fashioned and out-of-date, to say nothing of being too expensive. Adherents to the MSX ideal was lyrical about the advantages of software and hardware compatibility. In reality, MSX is probably neither as bad nor as wonderful as it is painted. Whether it succeeds or fails will depend as much on the skill with which it is marketed as on its own merits.

The relevance of all this to Dragon is that Eurohard appears to have acquired a license to produce an MSX machine. Given that Eurohard is now manufacturing Dragons in Spain, this implies that future Dragons may be based upon the MSX standard rather than the familiar 6805 chip. Consequently, Dragon's future may be intimately linked with the success or otherwise of MSX.

However, Dragon Users can take some comfort from Eurohard's Justo Alvarez who has pledged that the UK will not be abandoned. Nevertheless, it would seem obvious that Eurohard's first priority must be to build up the Spanish and European markets. The UK, certainly as far as the 32 and 64 are concerned, offers fewer opportunities for immediate expansion.

The question which will concern existing Dragon users is whether or not any future Dragon MSX machines will be compatible with the original 32 and 64. This question is, as yet, unanswered.











# RETURN OF THE RING

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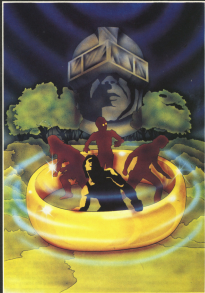
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Underground stations: St. James park (District and Circle lines), Victoria (District, Circle and Victoria lines).

There is an NCP car park in Abingdon Street, a few minutes away.

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# 6809 show

OVER seventy-five per cent of the available stand space at the 6809 Colour Show for Dragon and Tandy users on November 17 and 18 had been filled at the time of going to press.

Richard Bergin, project manager of Computer Marketplace, organisers of the event, was confident that the show would be a success judging by the response both from companies that will be showing their products and from the public at large. "We have had an average of £70 per day of ticket sales for the show," said Richard, "which is just less at the same time as we had for the Acorn User show that we organised earlier in the year."

The show, the first ever for the Dragon and Tandy compa-

nies, will be a major opportunity to gauge the amount of commitment left for the Dragon. Most major Dragon software houses have looked stand space and it is believed that Eurohard SA, the Spanish manufacturers of the Dragon, may be there.

Justin Alvarez, Eurohard's industrial engineer (see profile, page 18 this issue) has shown an interest in the event and, according to Richard Bergin, it is hoped that he may do a radio interview on the Young London spot.

Mike Quenish, a former Dragon Data director, has been in touch with Eurohard about the possibility of someone from the company appearing on London Broadcasting Corporation's Young London spot

at 3 to 3.15 pm on Sunday, 11 November, a week before the show starts.

Mike's interest in the show is purely personal, having worked so hard to bring about the success of the Dragon Professional and CG-8.

Neither BBC nor Touchmaster will be attending.

Microdeal will be selling its products at a special offer, with at least £1 off everything according to managing director John Symes. Some items will have up to 75 per cent off, and Microdeal will also be introducing its new range of low cost games for the Dragon.

There will also be a free stand for the User group or any group of people who come up with the best application for Dragon software, manuals or other forms of communications.

Richard Bergin has written to several User groups giving them the chance to come up with an idea, and any group of persons interested in having a stand at the fair and who come up with the best idea for an application for the Dragon are asked to contact Richard at Computer Marketplace, 20 Orange Street, London WC2H 7ED, telephone 01-500 1812.

Computer Marketplace is also offering readers of Dragon User a 50p discount to enter the show.

Simply cut out the coupon on this page and take it along with you when you go to the show. The coupon is valid for one day only and only one coupon per ticket is allowed.

## Unpaid debts

GAMES and Computers founder John Richardson is facing legal proceedings to recover outstanding debts.

Several companies are believed to be seeking court permission for public examination of his accounts. Microphenix has entered judgement against him for £5,500 as proprietor of Games and Computers, according to company secretary Richard Davis. A charging order has also been made against his property, although the serving agents have been unable to locate him. Permission is now being sought to serve a writ by post.

Readers who have sent money to the club are unlikely to see either their money or any orders that they may have placed. It is thought that John Richardson has debts totalling £20,000.

Computerhouse UK Limited are not involved in any of the legal action. As of the 30 August John was effectively dismissed from the company.

Alan Monaghan of Computerhouse UK Limited said that John had been operating as a sole trader under the name of Computerhouse UK, since January 1984. He approached Alan and other directors of what is now Computerhouse UK Limited (see Dragon User, September page 8) who initially tried to help people to secure their orders. John was appointed to the board of directors as a pretense to Computerhouse UK Limited taking over the activities of Computerhouse. However, when Alan realised the extent of John's troubles it was decided not to take over the activities of the club. This leaves John Richardson as a sole trader liable for all outstanding debts. "It never was our problem," said Alan Monaghan, "John got himself into a terrible mess and we tried to sort out his problems".

Cotswold Computers who are interested in taking over the running of the club are likewise not involved in any of the legal action. David Tomlinson of Cotswold Computers has taken the list of club members, thought to number about 2,000 and is in discussion with several interested parties about the editing of a magazine.



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## S.O.S.

A DRAGON owner has contacted Computer Marketplace with a problem. He is confined to a wheelchair but has received two free tickets to the 6809 show for himself and his helper. Although he works, he has no form of transport and is keen to attend his first ever show. Anyone in the Leach area who might be able to give Don Buckley and his helper a lift to and from the show is asked to contact them at 30 Airline Avenue, Harthill, Leach U3 4JL, telephone 0532-629634.



# GEC price deal soon

**CUT PRICE** Dragons and peripherals could be on offer soon throughout the major retail stores in Britain.

GEC is negotiating with Boots, Deans, Comet and other high street stores the price of its Dragon Data stock according to a spokeswoman at the company.

The company also has an agreement with Euronard to sell future Euronard products it has confirmed.

Ron Bosanko, former chairman of GEC Radio and Television, who played a major role in GEC's affairs with the Dragon (see Dragon User, May 1984) is, however, no longer involved with proceedings. He

has left GEC to join an electrical equipment manufacturer and has been replaced by Dr Ian Johnson, who has come from GEC Microelectronics. This



means the GEC has now lost its two top men (Brian Moore and Ron Bosanko, pictured) involved in the Dragon take-over.

## Complete system

**COMPUENSE** is offering Dragon 32 owners 543 credit in part exchange for any of its new deals. Managing director Ted Cornhill said that the company is making available several packages to provide users with a complete system.

A Dragon 32, single disk drive, Fax operating system, Editor/Assembler and disk Basic will retail for £298.95. Other packages incorporating hard disk drives and CBI-II are also being offered.

Any used Dragon 32's that the company gets hold of will be donated to Local Education Authorities. However, Ted claims that only a few 32's will be available for donation.

The reduced prices have come about due to GEC making available its stock that it obtained from Dragon Data.

For full details of the available packages and prices contact Compuense at 288D Green Lanes, Palmers Green, London, N13.



The M102/800 modem manufactured by Minsie Technology is a GART (British Approved Board for Telecommunications) multi-speed modem which can be used with telecommunications systems run by British Telecom. The modem, which is compatible with a number of computers including the Dragon 32, has baud rates of 75, 300, 600 and 1200. Unfortunately the company has no plans to write any software for the Dragon so Dragon owners would have to write their own. Further details about the modem (price approx £150) are available from Minsie Technology, 10-12 St Peter's Street, Ipswich IP1 1BA, telephone 0473-600416.

## New titles on the way

**TACKLING** Weerabix mutants, gold bar pickers and moonbase passengers are some of the delights awaiting users of the latest batch of software for the Dragon.

From Ronsik Software comes Weerabix versus the Ticks, a machine code arcade game featuring the characters from the Weerabix television advertisement.

The game is available from Weerabix at £3.75 including post and package and VAT. (Weerabix club members can receive a copy for £2.75.)

Weerabix are also holding a national competition offering 100 Dragon 32's, together with disk drives, colour portable televisions, six games including Weerabix v the Ticks and a gift in the dark poster as prizes. Details of the competition can be found on any Weerabix cereal packet.

Baby Computer games has four new Dragon titles. The Belts is a Handback type game with 54 screens of danger for you to challenge. Perilous Pit puts you deep in the crystal mines against the dreaded Grix and Bomb the Gold has the same theme.

Morbid Mansion is an arcade type adventure which has you in search of gold bars.

Baby's games now retail for £1.99 (down from £3.50) except for Morbid Mansion which retails at £3.99. Further details from the company at Crossways House, Lutterworth Road, Leicester. All of the

games will be on display at the 8000 show.

Microdeal has two new releases for November, Cavans of Doom a machine code test adventure and Starspaces an arcade style game. The company has also released three new games recently. Crystal Castle is an arcade game, Spygy a graphic adventure, and Escape from Moonbase. All games retail for £3, though Microdeal is working on a new range of low cost games which it hopes to retail for about £2.

Both Microdeal and Baby are negotiating with Euronard in the hope of getting their software included in Euronard's packaging for Dragon.

Design-design, formerly Crystal Computing is putting out Ronsik's Revenge for the Dragon. In very fast machine code, there is a full feature battle with missiles, tanks and so on. The expected retail price is £5.50.

## Software cuts

**TOUCHMASTER** has dropped the price of its software for the Dragon. Most games now retail for £3.95 (excluding p&p) with educational cassette tapes costing £5.49.

A complete list of the latest Dragon software prices and a mail order form can be obtained from Touchmaster at PO Box 47, Port Talbot SA13 12C.



"I'm sorry, but I'm afraid I'm not the only one who can use this computer. I'm afraid I'm not the only one who can use this computer. I'm afraid I'm not the only one who can use this computer."



# The Spanish connection



A THIRD LEAGUE of life is being given to the Dragon, courtesy of Eurohard SA — the Spanish-based microcomputer manufacturer. Backed by a combination of public and private funds, Eurohard is in business to "give continuity to the Dragon's life and improve its overall standing", according to Senor Justo Alvarez, Eurohard's top man in the UK.

Senor Alvarez is Eurohard's director for Industrial Engineering. He has been in Britain for over a month-and-a-half organising and overseeing the transfer of machinery and products from Dragon Data's plant in Port Talbot to Eurohard's factory in Gaceros, Spain. His aim is to begin immediate manufacture of the Dragon 32 and 64 in Spain for world-wide distribution. In the short term, Eurohard will produce the Dragon to the exact same specifications as Dragon Data's 32 and 64. However, within six months, there could be some interesting developments.

Justo, who spent 10 years working for the national Spanish railway company prior to joining Eurohard, is hoping to specialise in the development of new products once he has managed to get the manufacture of the 32 and 64 on the way and has overcome any initial teething problems. With Spanish railways, he was responsible for development planning and was especially concerned with data processing. The Spanish railway company, he said, was the first in Europe to have electronic ticket sales, developed in conjunction with the giant German electronics company Siemens.

## MSX — top of list

The project that comes top of his list is Eurohard's development plans in the manufacture of a Dragon MSX machine. Eurohard has obtained an MSX licence from Microsoft for an undisclosed sum and plans to begin production of the machine at the beginning of next year. The company is also studying the feasibility of adding a second chip to make the machine compatible with Dragon software. Justo confirmed that it was Eurohard and not GEC that has obtained the licence to

manufacture the Dragon MSX machine.

So important a priority is MSX, that Eurohard is striving, for the time being, plans to manufacture the Dragon Professional, or project Alpha, as Justo referred to it. "Alpha is not so important, we are more concerned with MSX and peripherals."

Eurohard has huge financial backing. Public sector finance comes from two Spanish development agencies — Soviec and In. Soviec is a local development agency with just under a 40 per cent stake in Eurohard. In, the national development agency, has a less than 10 per cent stake, but owns half of Soviec and is reputedly the largest business consortium in Spain. It has diverse fields of interest and is especially concerned with new technology, hence the stake in Eurohard.

Together, the two development agencies own just under half of Eurohard. The major backer of the company is a large financial group headed by Spanish Vasa card chairman, Eduardo Mengo, though Vasa card itself has no connection with Eurohard.

Formed earlier this year, Eurohard's headquarters is based in Madrid, the

communications capital of Spain. Eurohard's Madrid offices will be responsible for public relations and marketing, while the manufacture of the computers will take place in the Spanish regional development area, Gaceros, near Portugal.

Justo claims that the Dragon is the third biggest-selling micro in Europe, coming behind the Spectrum and Commodore machines and, in Spain leastways, ahead of the Atari and Oric. He intends to maintain and hopefully improve on this position, particularly in countries where there are no attached computer firms.

## Obvious advantages

There are obvious advantages in Eurohard's attack on the Spanish market and it is evident that the company expects to capture the lead from Sinclair. To back this up, a Spanish television programme is planned, with Eurohard taking a similar role to that undertaken by Ascom for the BBC computer to show in Britain.

Justo stresses, however, that Eurohard is not solely concerned with the Spanish market. The company is concentrating on a world-wide user base, including Britain. In the UK, distribution will be by GEC with technical support by Teletexteter.

When asked if he thought that many more Dragons would be sold in Britain he replied that GEC is a large company "and large companies are not used to thinking in the short term — take this as a sign that the Dragon will improve its position in the UK". Justo went on to say that Eurohard is getting in touch with software companies in Britain, and indeed "with all the people we know who have connections with the Dragon".

"We are open to help and suggestions that could be beneficial for the Dragon, especially concerning software and peripherals — we can't distribute and sell them by ourselves. I hope this is the beginning of a new Dragon era", said Justo. "We don't want Dragon owners to feel abandoned — they are not abandoned."

— Gordon Ross



Justo Alvarez of Eurohard



# BACK TRACK

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## Hatch

Program: *Chicken Run*, Impact, 148 Bellamy Hill, London SW13 8SL. Price: £7.95.

FARMER Folly runs a chicken farm — rather a small chicken farm, as there is only one chicken in it. You have to guide the chicken to the nest-boxes, where she will auto-lay and lay an egg, and to the feed trays to replenish her energy with corn. You also have to guide Farmer Folly to collect the eggs before they hatch into hungry chicks, and to fill the feed trays.

There is a buddy as well, of course — a fox appears at intervals through holes in the wire, intent on eating the chicken, in one of the newly-fashioned crises. Having a chick eater is quite a good thing, as this prevents it from depleting the corn supply, if the fox eats your chicken, however, one of your three lives is lost.

The game is controlled by joystick only. The joystick lever controls the direction in which the chicken moves, and

the fire button controls the farmer. This technique of controlling two moving objects with the same joystick doesn't seem to be terribly effective; I found it impossible to persuade the farmer to do anything except run aimlessly up and down a ladder unless the fire button was held down continuously, when the farmer's movements were no less random but more purposeful.



The graphics are good, though I would have liked to have more than one screen. The sound effects are initially impressive, but soon become irritatingly repetitive.

On the whole this is an interesting game, but not, I think, one with lasting appeal.

Margaret Norman



## Bubble

Program: *Ca'ter*, Microdeal, 41 Tresco Road, St Austell, Cornwall. Price: £9.95.

C'USER from Microdeal involves directing a cubby looking orange creature of the same name around a pyramid of cubes. The object is to change the colour of each of the cubes to the "target" colour, displayed at the top of the screen, by hopping on them.



On the lower screens only

one or two hops are required to change a cube to the correct colour. However, as the game progresses, the cubes change colour every time you hop on them, even if they were the correct colour to start with.

Various hazards exist to try and stop you. These include balls of assorted colours, Wipers, Dorks (?!), and Rants (?!), some of which are fatal to touch, others do things like changing the colour of the cubes they jump on, just to make things worse. Jumping on a green ball causes all of the hazards to freeze, allowing Ca'ter a few seconds' respite.

The player has three lives, and when one is lost by touching something that shouldn't be touched Ca'ter emits a burbling noise and mutters "H?" (in a speech bubble) under his breath. I suppose it's nice to find an alien that's human for a change (?!).

The graphics are as good as PACMAN 3 allows, although the movement is rather jerky, and not up to the author, Tim Mox' usual standards. The

sound effects too are a bit limited, consisting mainly of "boing" and "squeech" noises. The overall effect however is good, and compared to some

of the games currently on the market, Ca'ter scores well.

David Rowlands



## Stakes

Program: *Cool Pays 21*, Sino Software, PO Box 20, Watling, Surrey GU21 3DH. Price: £4.95.

SINO Software is a new name to Dragon Readers, its first releases are both card games, namely *Cops and Ponies* — the latter is reviewed here.

*Cool Pays 21* is a faithful reproduction of the game of Pontoon with a few extras added. The program, which is written in Basic, automates on loading and after several title screens, some in high resolution graphics, gives brief instructions on how to play.

causes a different format display to be shown. The game is very simple to operate, you simply enter your stake and press "Y" to bet or "S" to stick.

Unfortunately, there seems to be a few bugs in the program. An ace can count as one or eleven in pontoon, but *Cool* always uses it as eleven which means he sometimes "busts" below 21.

Another, more serious, oversight is that the cards always appear in exactly the same order after loading the game. This is because the random routine used resets the random number seeds that the program uses, and the program doesn't bother to



The graphics involved in the game range from good to disappointing — all the cards are displayed using low resolution chunky graphics and text, however there is a nice picture of *Cool P Dragon* — your opponent in the card game. *Cool* appears after each game either grinning or frowning depending on whether he has won or lost.

Achieving the magic 21

randomise these at the start of each game. Obviously, after a while you get to know the pattern of cards which defeats the object of the game.

At £4.95 this piece of software is one of the cheapest around, but don't expect to get anything stunning for that price.

Brian Cudge



## Attack

Program: *Android Invaders*, Liverpool, 86 Lime Street, Liverpool L1 1JH. Price: £9.95.

WHEN I saw the word "Invaders" in the title of this cassette, I must confess my heart sank a little. What games-players

(and reviewers) look for is something new, exciting, different . . . not just another version of a tired old game. Then I thought, no, there are so many invaders games on the market already that this surely can't be the same again — it must surely have some new twist to it — so I loaded it with high hopes. I'm sorry to say,



though, that these proved unfounded.



Not only is this a concept utterly unoriginal, game, it isn't even a good one. There are some major bugs in it which cause you to be helplessly with great speed. I tried playing it with both keyboard and a joystick, at several different levels of diffi-

culty, with the same result every time — I shot one or two little aliens, then I apparently got hit by a succession of invisible bombs and the game ended.

What I saw of the game before disappearing in a puff of smoke made it depressingly clear that, even without the bugs, this tape would really not be a useful addition to anyone's collection. The graphics are uninspired, the sound effects dull, and the action slow. The attractions promised by the instructions in later phases of the game didn't sound at all enthralling, either.

Sorry, Lynxsoft, but this really isn't up to the standards of commercial software nowadays. Back to the drawing-board with this, please!

Margaret Newman



## Legions

**Program:** The Fall of Rome, Angus Press Software, 1 Geyden Lane, Bowers, London W11 2AB. Price: £9.99

THIS IS an adventure-type game written in Basic, and also available for a number of other machines. The general idea is that you are in charge of the Roman Empire, with control over forces, income, expenditure and so on in all parts of your Empire. On the screen you have a coloured map of Europe (as we call it today) with the countries (as they were then) marked on it. Others are trying to destroy it.



During each stage a marker indicates which country you are dealing with at any one time, raising armies, constructing legions to mobile legions and so on.

While you are busy trying to put your Empire in order,

Eleven tribal groups from the north cause a lot of bother and as if this was not enough you also have to find time and resources to do battle with armies from the two Empires of the East.

The game progresses through three phases. The Income and Expenditure phase, the Movement phase and the Combat phase. I found that it took a great deal of practice to be able to understand and play this game properly and even stand a chance of securing a victory. Playing a game does take up a lot of time, but if you are "into" this type of game then it is quite good and takes a lot of concentration.



The display is also quite good, though I feel the game is not for the younger members of a family.

top up Bryan



## STAR GAME

## Quest

The Guardian of Shedin is defeated. The hero of the Evil Sage is at bay. Now Ringbeard's wielder of the Four Bright Rings must face the greatest challenge to return the Ring of Darkness to its creator on the hidden planet Ringworld.

**Program:** Ring of Darkness, Winterson, 36 Uplands Park Road, Epsom, Middlesex E9 3PT. Price: £9.95

WHEN Winterson originally released *The Ring of Darkness* it was surely one of the best adventure games available for the Dragon. The game enjoyed such success that it was inevitable that a sequel would follow.

Return of the Ring is subtitled *"The Ring of Darkness Part 2"*, but as a piece of software it is far superior to its predecessor. The program is written in 100% machine code with full colour high resolution graphics (PMODE 2) mixed with text which includes lower case.

A frame picture showing your location is constantly displayed. Below this is a text window where command lines are entered. One of the best features of this game is its ability to handle useful sentences, such as "Give the dagger to Mark the 50" and so on.

The quest begins in a maze which is displayed from above, figure movement is achieved via the arrow keys. In this part of the adventure you can fight and transact with mutants and enter villages to buy and sell useful items. These villages are also displayed and entering a shop causes a 3D picture of the inside of the shop to be displayed.



It must not block your path.



It must not block your path.

As with the *Ring of Darkness*, side A of the tape enables you to set up your role play character — you are given points to divide up amongst number of lives and various characteristic attributes, and you must also decide what form your character will take, for example "Human Warrior" or "Elf Technician". This procedure need only be done once as you can save the game and your character on tape at any point.

The game itself is an aside two of the tape. Clear instructions are given as to when to start the cassette — the game is too large for 50k so parts are loaded in and out as required.

Other locations, such as the forest planet, are loaded in from tape and are shown in excellent 3D graphics. A few characters that you meet are controlled by a program called Acol, and are capable of doing most things you can do of their own free will and may join you to help in your quest.

There is simply not room to describe all of this game's features — the program took over a year to create. It is certainly the best adventure role play game that I have seen for the Dragon so far and is excellent value at £9.95.

Alvin Cridge





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# Playing with sprites a la mode

Brian Cudge reviews Premier's sprite graphics board

FOR THOSE Dragon owners who turn green when they see graphics produced by Atari and CSM 64 machines, help is close at hand. Premier Microsystems has just released a sprite graphics board for the Dragon 32.

The board itself is connected via a ribbon cable to the Dragon's cartridge port and takes all its power from the host computer. After initial power up, the user simply types `GOSG AH9002` and takes the lead from the Dragon's socket and puts it in the one provided on the graphics board.

All the electronics are housed in a two-tone plastic case measuring about 4 x 6 inches, and it can be purchased either ready-assembled or as a kit. The circuitry is quite complex and very tightly packed so you need a fair amount of experience before attempting any self-assembly. Instructions and a wiring diagram are given in the manual, but these could hardly be described as being written for the beginner, and there are no hints or fault finding.

## Four modes of operation

The new display is produced by a Texas Instruments TMS 9929A VDC chip. This offers four modes of operation with 32 sprite levels and 16 colours.

Sprites are simply moveable graphics objects which have their own priority level — that is, the sprites with a lower priority will pass "behind" those with a higher priority. Sprites are totally non-destructive and don't need to be "rotated out" when they are moved. As each plane can contain only one sprite this means 32 individual sprites can be displayed at any time, although the lowest priority is the same as the background colour and will not often be used.

The four separate display modes offer the following:

Mode	Resolution	Colours
1 text	40 x 24	text only 2 of 16
2 text	32 x 24	sprites 16
3 graphic	64 x 48	16
4 hi-res	256 x 192	sprites 16

(2 in a group of 8 pixels horizontal)

4. Graphics: 64 x 48 sprites 16  
On power up, mode 1 is automatically selected with white text on a dark blue background. The display quality is very high — much improved on the Dragon's own hi-display. Mode 1 is usually used for programming as this can display the most characters at once, but cannot have sprites. The display is noticeably slower than the Dragon's own, especially when scrolling.

Probably the most useful mode for

games is Mode 3. Although the resolution is a chunky 64 x 48, you do get the advantage of mixing text with graphics. In addition, all game characters are likely to be sprites which have the same resolution in any mode. Two sets of sprite shapes are available and all of these are redefinable. The first set is the entire character set, and can be used only in mode 3. The other set contains 32 shapes and can be used in any sprite mode.

Sprites can be displayed as either normal or double size in all modes. However, all sprites have to be the same size.

The graphics board also contains an sprant to interface the new commands available with Microsoft. The technique used is to intercept the command handler at the Dragon and check for certain commands such as `Print` and `CLS`. The computer is then redirected to give these new meanings. I prefer the method of adding commands, as this prevents the programmer from having to use rather meaningless commands like `RESET` to define a sprite shape. Most of the new meanings are more obvious; `PAUSE` is used to select the mode, although the graphics page number is no longer required as the board has its own 16K of video memory.

This extra memory also has the advantage of freeing most of the Dragon's memory that is usually reserved for its own display — over 5K is returned to the user. It is not possible to switch between the Dragon's display and the board's display without switching off first. Also the Dragon's sound is not produced through the TV speaker when using the sprite board.

Commands to set points, draw lines and circles are included, but most commands, not being text, neither `Print` nor `Print()` can

be used as normal on the now expanded screen. `Put` and `Get` are not included as these are obviously not needed with the introduction of sprites. `PUT()` is used to position a sprite on the screen — the x and y coordinates are given, together with the colour, shape size and level of priority.

In addition to the sprites, all the characters are redefinable using the `"PRINT"` command, so it is possible to get pseudo hi-res graphics even in the text modes.

Although the display potential of the board is greater than anything a Dragon could normally produce, the implementation of the Basic leaves something to be desired. As already mentioned, the "new" commands are either limited compared to the Dragon's own. In addition, one of the most important parts of sprite graphics is missing completely — that is collision detection.

The games programmer will have to muck around with comparing coordinates, with all the problems that entails. There is also no facility for setting sprites moving on their own in a given direction, each one has to be individually moved. With 30 odd on the screen this can seriously affect the speed of a Basic game.

The manual which Premier supplies with the board also contains details of machine code entry points to their ROM for anyone wanting to write arcade speed games using the board. The manual describes each command in detail, but there is only one example program given at the end and this doesn't even use sprites! Although the general documentation is good, it is not up to Premier's usual high standards. Many more example programs are needed.

## Comes the crunch

The crunch comes when you see the price — £99.95 as a kit or about £120 ready-made. This may seem a bit, but is not unreasonable considering the components involved. Unfortunately for Premier, I think many users will jump for cheaper software alternatives like "Sprite Magic" from Knight Software at £17. Although you don't get the advantages of 16 colours, an improved display and hardware sprites, you do get the same upper/lower case, software sprites and a much more thorough extension to Basic.

The final decision as to whether you really need this board is yours of course, but be warned, the board will only operate with 52K machines. Due to a short-cut taken by Premier in its design, the board will not work with upgraded Dragon's or Dragon 64's. However, Premier say they can alter boards for 64K machines if required. ■



Peter Kites of Premier



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# Spiderbyte

*D.J. Orrell spins a web to catch a fly*

**HARRY'S WEBB** is a game for one player requiring quick reactions and concentration at all times. Using the keyboard you must direct Harry around the screen in pursuit of flies. Each time you catch and kill one, another appears at a different location.

The flies, however, will not sit and wait for ever — they will fly about aimlessly. The game itself has five levels with 10 flies to kill in each level. You will automatically progress to the next level when you have killed all 10.

To add a little more tension to the game a bug is working his way down the right hand side of the screen and should be reached the bottom before you have caught

10 then he will leap out and gobble you up.

## Program Notes

20-40 Sets up music strings  
60-210 Prints instructions  
320-440 Main loop

450-490 Moves spider up  
510-540 Moves spider down  
560-590 Moves spider left  
610-640 Moves spider right  
660-690 End routine  
860-940 Checks score

950-1000 Pokes data to graphics screen  
1130-1260 Draws main screen  
1300-1500 Draws fly screen



```

1  REM*****
2  REM*****HARRY'S WEBB*****
3  REM*****IC3 *****
4  REM*****D.J. ORRELL*****
5  REM*****
10 DIMBA(11),DB(11),DR(11),DL(11),F(11)
   ,B(11),BL(11),FD(11),FL(11),FU(11),BU(1)
   ,F(11)
20 HB="TIDCVC3140HFGOLGB-PCL4GL1B-"
30 GB="DVC3140FHFPCLSPP4ALSPCL4
   BBL3GL4FPCGLZPCL4GLZBL4L1F"
40 LB="TDC3L4GFLZGL4GBGLZLFLZGL4L
   L2GL4GBGLZLFLZGL4GLZGL4GBGLZFL4GL
   L3GL4GLZGL4FLZGL4GLZLFL"
50 CLS:GOSUB 1300
40 PRINT:HARRY IS A SPIDER WHO LEV
   ES UP
70 PRINT:PRINT"A BIGHT WEBB,"
80 PRINT:PRINT"HARRY IS CONSTANTLY
   BEING"
90 PRINT:PRINT"BOTHERED BY FLECKY
   FLIES,"
100 PRINT:PRINT"NEVERTHELESS, HE IS AT
   YOUR COMMAND,"
110 PRINT:PRINT"USING THE ARROW KE
   YS YOU MUST"
120 PRINT:PRINT"CATCH AS MANY FLIES
   AS YOU CAN"
130 PRINT:PRINT"*****PRESS ANY
   KEY*****"
140 DB=INKEY$:IF DB="" THEN 140
150 CLS:PRINT:PRINT"THERE ARE TEN
   FLIES TO CATCH"
160 PRINT:PRINT"IN EACH OF THE FIV
   E LEVELS,"
170 PRINT:PRINT"but beware a BUG
   HAS GOT HIS"
180 PRINT:PRINT"YES ON YOU AND IF
   HE REACHES"
190 PRINT:PRINT"THE OPENING IN THE
   WALL IT'S"
200 PRINT:PRINT"BYE BYE TO
   HARRY!"
210 PRINT:PRINT"*****PRESS ANY
   KEY*****"

```

```

220 DB=INKEY$:IF DB="" THEN 220
230 CLS:R=360:L=150:O1=0
240 PRINT:GB3="CONTOUR OF 1081"
   BBL3="CONTOUR OF 1081"
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# Turtle comes out of its shell

John Payne presents a turtle graphics program written in Forth

TURTLE GRAPHICS is based on the "turtle", which can be told to move forward or backwards, left or right and various other things. The original "turtle" was a hemispherical shell containing motors and electronics, that was linked by a cable to a computer. By typing commands on the computer, the turtle could be moved around the floor (which really needed to be covered with paper). It had a pen which could be up (not touching the floor) or down (touching the floor) so that as the turtle moved it could draw a line on the floor that showed the path it had followed. Similar turtles are still available.

A later idea was the "screen turtle" which moves around on a television screen instead of on the floor. This program provides turtle graphics based on a "screen turtle" by giving Forth definitions of the words a Turtle should understand.

The Forth definitions are on screens 4 to 18 of the listing. They have been tested and found to work on both Caste and

Dragon Data Forth (however the Dragon Data Forth I used had an error that prevented text being entered to the Forth screen — this error is fixed by HLR 28-60 4PBC 5). The definitions should also work on other versions of Forth if words that calculate sine, cose lines and save screen areas, are defined.

You need to know two things about the turtle: where it is and which direction it's facing. You can tell where it is because it is drawn on the screen (as a right-angled triangle). The pen (which draws on the screen if it is down) is at the right-angled corner of the triangle. The arrowhead shape of the turtle is designed to point in the direction which the turtle is facing, which is the direction it will move when ordered to go forward.

To move in other directions, the turtle must first be turned to face the required direction, and then ordered forward. Bear in mind that the screen is showing the floor, and you are looking at the turtle and

floor from above. This means that if, for instance, you order the turtle to turn right 45 degrees, it will turn 45 degrees clockwise.

Once screens 4 to 18 are loaded, you can tell it what to do using the following words:

## 1) Display Control Words:

**T** This word switches the display from the text screen (where you type in words) to the graphics screen (which is the floor that the turtle moves around on). This word should be used before a sequence of commands to the turtle, if you want to see the commands being executed.

**Example 1** 10/40 80 RT 90/40  
Note: Forth words are not executed until you press the Enter key so all the examples must, of course, be finished by pressing Enter.  
(Shift T) This has the same effect as T except that a different set of colours is used. ▶

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**NEW  
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**DRAGON 32**

## TOUCHSTONE

To gain the Secrets of the Touchstone. Your main objectives are to "STAR ALIVE", to collect the wondrous treasures and get the keys to the vaults between the levels. Various monsters appear at strategic points throughout the maze, intend upon stopping you reaching your goal. But Al, in his infinite wisdom has equipped you with a ray of light which shoots from your eyes, killing anything in your path. 11 levels, 60 screens, 100% machine code, high resolution graphics, sound and many intriguing extras. For 1 or 2 players. Joysticks required.



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**NEW  
FROM  
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**DRAGON 32**

## Beam Rider

In this completely original and incredibly fast game you play the beamrider. Your mission is to rid the world of those formidable blocks of nuclear waste, by sucking them up with your beamer - an incredible piece of human engineering. Avoid the Greengrass Crushers - grab the Greengrass (but above all, get rid of them there blockst) 100% machine code, full color hi-res graphics and superb sound. One player game.



One Joystick  
required.

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**DRAGON 32 &  
TANDY COLOUR  
16K**

Tandy Colour versions only  
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## Cuthbert in Space

The Federal Chief has decided that Cuthbert is to go on a mission of plunder against the Moronians Solar System. Cuthbert land's his spacecraft on each planet but then has to refuel by stealing pods from the Moronian fuel dumps whilst avoiding the Solar Meteoroid Barrage. After filling up he goes and plunders as much loot as possible before take-off. All could go well but when he gets a malfunction he must send a pilotless shuttle to obtain spares and take off before the Moronians' bombs detonate.



Joystick  
required.

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## Danger Ranger

Another winner from "The Master", Ken Kalish. You as the "Danger Ranger" must collect ten keys from the Chambers of Pasts, winding off the Floating Arms, Radioactive Bats and Raving Eyeballs. Then he must pass through the Acid Chamber, to collect all the treasure chests, not only avoiding acid drops but also shooting the demons which are on guard. 5 levels of play, explosion-sound, full color and 100% machine code. 1 player. Joystick required.



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# Build your own drawing arm

Peter Whittaker explains how to build a drawing arm

HERE IS another project for fellow Dragon owners with hand-tisted soldering irons. I have long regarded with jealousy the digitising units or drawing arms available for the Spectrum and BBC models. I eventually set out to see what I could accomplish with my trusty Dragon.

The 8 bit A/D converter used by the Dragon (ysticks) splits the reading from a 100K potentiometer into 64 steps (0-63). If the standard 100K pots with 270 degrees of turn are used, there is an angular resolution of about 4.5 degrees per step (270/64). With a drawing arm of 10 inches in length pictures could be copied in blocks of a half-inch-square resolution. This is obviously completely useless. The problem is resolved by using 150K pots with only 30 degrees of rotation. This gives an angular resolution of 0.5 degrees per step, and with a 10 inch arm a copying resolution of 0.1 (1/10) inch squares. This is good enough to be worth doing.

The 30 degree pot does not allow much movement so the positioning of the two arms has to be redesigned. Placing them at right angles (figure 1) gives 30 degrees of movement in both axes. The area covered will not be a perfect square, but a rhomboid. This is because the angle of the second arm to the vertical will vary according to the angle of the first arm (figure 2). However, accurate copying will be achieved within this rhomboid area.

If we take the shoulder as our origin (O) the position of the elbow (A,B) can be easily calculated.

$$A = L \cdot \cos(A1) \\ B = L \cdot \sin(A1)$$

If the first arm is not horizontal the second arm will not be vertical when it is at right angles to the first arm. The angle of

the first arm (A1) needs to be subtracted from the angle of the second (A2) to find its angle to the vertical (figure 3). The position of the "finger" (C,D) can now be calculated.

$$C = A + L \cdot \sin(A2 - A1)$$

$$D = B + L \cdot \cos(A2 - A1)$$

If the arms are 10 inches long these will



Fig 1 Back arm design

be a range of finger positions from 7 inches to 13 inches along each axis. If this is multiplied by 10 then the equivalent point on the hires screen can be past (litter 1).

Listing 2 scales up the size of the copy and draws a line from the last point set to the next. By pressing the fire button, the program switches between drawing a line and moving a dot across the screen. Pressing any of the keys 0-9 will set the colour of the line. Pressing the (R) key will dump the screen to a Sokolova printer.

To construct the electrical wiring of the drawing arm, the wiring diagram used is exactly the same as that for a joystick (figure 4). Take the joystick unit and with a small screwdriver or penknife bend back the clips which hold the potentiometers in



Fig 2 Angle of second arm to vertical

place (figure 5). The assembly will fall apart once the pots have been removed.

Take the four long pieces of wire and solder one to each of the pins #1,3,4 and 5 of the DIN plug. Solder the extra long wire to pin #2. Now connect and solder wire #1 to the centre leg of pot #1; wire #2 to the centre leg of pot #2 and wire #4 to one leg of the fire button. Use a 12 inch wire to connect the left leg of pot #1 to the left leg of pot #2.

A second 12 inch wire connects this left leg of pot #2 to the spare leg of the fire button, which is then further connected to wire #3 from the DIN plug. Connect wire #5 to the right leg of pot #1, and a 12 inch wire to further connect this leg to the right



Fig 3 Joystick with

leg of pot #2. Insulate all connections with tape, and check for short circuits.

To construct the drawing arm themselves, obtain two pieces of strip metal (wood, cardstock, or whatever) about 10.5 inches long, and drill a hole at one end of each just big enough to fit over the lug on the potentiometers. Drill a second larger hole at the other end of the first arm (so it goes around the back of the lug on the underside of the pot without rubbing).

Plug the DIN plug into the right joystick



Fig 4 Circuit diagram for drawing arm



at, type in listing 3 and RUN it. Set pot to a value of 31 and then give an arm on to the leg of each pot. Check to make sure that you can turn it sufficiently to get the full 0-99 range of readings, then give the back of pot #2 to the end of arm #1 (with the hole in it) making sure that pot #2 can still turn.

Pot #1 can either be permanently fixed to a drawing board, or temporarily stuck to the table with blu-tack. If blu-tack is used

then be careful that moving the arm turns only the potting and not the whole pot assembly in its blu-tack base.

That should be the drawing arm complete. Minor adjustments may have to be made to the program. The ratio of  $(X-32)/2$  for the angle may need slight adjustment depending upon the accuracy of the pots used. The actual length of arms used if not 10 inches each also needs to be taken into account. The programs will run much

better if your Dragon can take the speed-up poke (POKE65496,0). ■

### Parts list

- 4 pieces of wire 3 inches long
- 1 piece of wire 4 inches long
- 2 pieces of wire 12 inches long
- 1 of 270 Ohm 1/2W 10% plug
- 1 push button switch
- Tandy 270-1541 AT 20 for each of it
- 1 Tandy joystick potentiometer 271-1002 at £2.99

```
10 PHODE4.1:PCL8:SCREEN1.1
20 L=10
30 A1=JOYSTK(0):A2=JOYSTK(1)
40 A1=(A1-31)/2*(180/3.1415926):A2=(A2-31)/2*(180/3.1415926)
50 X=LBX(COS(A1)+SINK(A2-A1)):Y=LBX(SINK(A1)+COS(A2-A1))
60 X=INT(100X+0.5):Y=INT(100Y+0.5)
70 PSET(X,Y.1):GOTO30
```

Listing 1

```
10 L=10:A=2:PHODE3.1:PCL8:SCREEN1.1
20 A1=JOYSTK(0):A2=JOYSTK(1)
30 A1=(A1-31)/2*(180/3.1415926):A2=(A2-31)/2*(180/3.1415926)
40 X=LBX(COS(A1)+SINK(A2-A1)):Y=LBX(SINK(A1)+COS(A2-A1))
50 X=INT(200X-4)+0.5:Y=INT(200(Y-4)+0.5)
60 A$=INKEY$:IF A$=""THEN G0
70 IF A$>"^AND A$<"^"THEN COLOR VAL(A$):GOTO100
80 IF A$="B"THEN 140
90 IF PEEK(65280)=126 OR PEEK(65280)=254
THEN SOUND100,1:IF A=1 THEN A=2 ELSE A=1
100 ON A GOTO 110,120
110 LINE=X,Y:PSET:GOTO20
120 P=POINT(X,Y):FOR B=1 TO 8:PSET(X,Y,B):NEXT PSET(X,Y,P)
130 DRAW "BH"+STR$(X)+", "+STR$(Y):GOTO20
140 CLS:PRINT"CHECK PRINTER IS ON AND CENTER":EXSC41194
150 PHODE4.1:SCREEN1.0
160 PRINT#-2,CHR$(13):CHR$(13)
170 FOR A=0 TO 255 STEP 7
180 FOR B=191 TO 0 STEP -1
190 C=128+POINT(A,B)+POINT(A,B)+2+POINT(A+1,B)+4+POINT(A+2,B)+8+POINT(A+3,B)+16+POINT(A+4,B)+32+POINT(A+5,B)+64
200 PRINT#-2,CHR$(C):CHR$(C)
210 NEXT B:PRINT#-2,CHR$(13)
220 FORB=191 TO 0 STEP -1
230 C=128+POINT(A+3,B)+POINT(A+4,B)+2+POINT(A+5,B)+4+POINT(A+6,B)+8+POINT(A+7,B)+16+POINT(A+8,B)+32+POINT(A+9,B)+64
240 PRINT#-2,CHR$(C):CHR$(C)
250 NEXT B:PRINT#-2,CHR$(13)
260 NEXT A:PRINT#-2,CHR$(13)
```

Listing 2

```
10 CLS
20 PRINT@32:"POTENTIOMETER CALIBRATION."
30 PRINT@96:"POTENTIOMETER #1",JOYSTK(0)
40 PRINT@160:"POTENTIOMETER #2",JOYSTK(1)
50 IF INKEY$=""THEN@ ELSE END
```

Listing 3





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# DRAGON OPEN FILE

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## Jigsaw

From R Whitfield in *Deedledeedee*  
THIS GAME started life as a simple exercise in the use of the Basic commands GET and PUT.

A complete graphics screen is divided into 30 separate blocks — a five by six grid, and each block is then stored using the GET command.

By reserving one-dimensional arrays for each block instead of the recommended two-dimensional array, the whole graphic screen can be stored in about 25K bytes.

Dragon Basic doesn't allow variables to

be used with DIM, GET, PUT, GOTO or GOSUB commands, so each array has to be named separately. A short introduction game has been included but don't be fooled. On loading the screen is filled by the graphics of a car. Parts of the car are moved about the screen and the idea of the game is to return each block of car to its rightful position.

```
10 CLS:PRINT#33,"WELCOME TO"
11 MB="      move 15"
12 FOR SL=1 TO 17
13 PRINT#65,RIGHT(MB,SL)
14 FOR I=1 TO 30:NEXT: SOUND 102,1:
NEXT
15 PRINT#115,"A GAME BASED"
16 PRINT#116,"ON THE SLIDING PUZZ
LE."
33 'A SIMPLE GAME USING GET AND P
UT. EACH DIM,GOTO,AND GOSUB HAS T
O BE DEFINED,BASIC REQUIRESARRAYN
AMES AND LOCATIONS NOT TO BE A VARI
ABLE.
34 PCLEARB
35 REM THE WHOLE SCREEN IS D
IVIDED INTO 30 BLOCKS. SA
ON BLOCK BEING HELD IN A ONE D
IMENSION ARRAY.
36 DIM A(139),B(139),C(139),D(139)
,E(139)
37 DIM#2(139),#2(139),#2(139),#2(139),
#2(139)
38 DIM#3(139),#3(139),#3(139),#3(139),
#3(139)
39 DIM#4(139),#4(139),#4(139),#4(139),
#4(139)
40 DIM#5(139),#5(139),#5(139),#5(139),
#5(139)
41 DIM#6(139),#6(139),#6(139),#6(139),
#6(139)
42 REM TWO ARRAYS ARE SET UP'A'
AND 'REF',THE GAME PLOTS THE BLOC
KS Actual SCREEN LOCATIONS AND
COMPARES THEM TO THEIR REFERAN
CE.
43 DIM REF(5,6),A(5,6)
44 G2=1
45 FOR S=1 TO 6:FOR R=1 TO 5
```

```
46 A(R,S)=S2
47 REF(R,S)=S2
48 S2=S2+1
49 NEXT R,S
50 PRINT:PRINT"WOULD YOU LIKE A SA
MPLE GAME Y/N":SOUND 130,1
51 SA=INKEY$:IF SA=" " THEN S1
52 IF SA="Y" THEN SA="1":GOTO 61
53 PRINT#20,"SOME REQUIRED SKILL
LEVEL 1-4"
54 SA=30
55 SOUND 130,2
56 SA=INKEY$:IF SA=" " THEN S=
VAL(SB)
57 IF S>4 OR S<1 THEN S=4
58 CLS:PRINT#33,"SELECT A DRAWIN
G "
59 PRINT#200,"1.CIRCLES":PRINT#23
2,"2. CAR ":SOUND 130,2
60 SA=INKEY$:IF SA=" " THEN#0
61 IF SA="1" THEN T=1 ELSE T=2
62 CLS:PRINT#133,"A SIMPLE PICTU
RE WILL BE DISPLAYED AND THEN SH
UFFLED.FOR YOU TO RESTORE. USE THE
ARROW KEYS TO MOVE THE YELLOW B
LOCK."
63 'NOW FOR A SIMPLE DRAWING
64 PRODEC,1:PCLS
65 IF T=1 THEN#0
66 CIRCLE(130,90),88,5:PRINT(130,9
0),3,1:CIRCLE(130,70),36,1
67 GOTO 72
68 DRAW#53:C2,B(10,1),#000D3R1E1R3F
4R5E4R3F2R1U5L301L1H1U5E1R6W4L13G
255H1L1R55R3E1R1F1D1G1L1H1U5R20E
1R1F1D1G1L1H1U1"
69 PRINT(50,50),3,2
70 CIRCLE(140,130),30,4:PRINT(143,12
7),4,4:CIRCLE(1204,130),30,4:PAINT(
```

Continued on page 28



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```

207,127),4,4:CIRCLE(140,130),15,2:P
PRINT(143,127),2,2:CIRCLE(1204,1207),1
5,2:PRINT(207,127),2,2
71 CIRCLE(215,40),5:CIRCLE(205,200
,5:CIRCLE(225,60),4,2:CIRCLE(160,5
0),15,4:PRINT(100,50),1,4
72 'THE 30 BLOCKS
73 FOR X=50 TO 205 STEP100
74 FOR Y=0 TO 150STEP 40
75 LINE(X,Y)-(X+50),(Y+30),PSET,
B
76 LINE(X+50,Y+30)-(X+100,Y+60),PS
ET,B
77 NEXT Y:NEXT X
78 LINE(5,0)-(255,180),PSET,B
79 IF I<>1 THEN G1
80 PAINT(1210,160),2,0:PAINT(10,10)
,0,0:PAINT(110,160),3,0:GOTO82
81 PAINT(1210,160),2,2
82 FOR D=1 TO 4:PCOPYB TO D+4:NEXT
83 CLS:PRINT83,"IF YOU WOULD LIKE
TO BE REMINDED OF THE DRAWING ON
E IT HAS BEEN SHUFFLED PRESS THE
/ KEY"
84 REM GET EACH BLOCK
85 GET(5,0)-(55,30),A1,G
86 GET(155,0)-(105,30),B1,G
87 GET(155,0)-(155,30),C1,G
88 GET(155,0)-(205,30),D1,G
89 GET(205,0)-(255,30),E1,G
90 GET(5,30)-(55,60),A2,G
91 GET(155,30)-(105,60),B2,G
92 GET(155,30)-(155,60),C2,G
93 GET(155,30)-(205,60),D2,G
94 GET(205,30)-(255,60),E2,G
95 GET(5,60)-(55,90),A3,G
96 GET(155,60)-(105,90),B3,G
97 GET(155,60)-(155,90),C3,G
98 GET(155,60)-(205,90),D3,G
99 GET(205,60)-(255,90),E3,G
100 GET(5,90)-(55,120),A4,G
101 GET(155,90)-(105,120),B4,G
102 GET(155,90)-(155,120),C4,G
103 GET(155,90)-(205,120),D4,G
104 GET(205,90)-(255,120),E4,G
105 GET(5,120)-(55,150),A5,G
106 GET(155,120)-(105,150),B5,G
107 GET(155,120)-(155,150),C5,G
108 GET(155,120)-(205,150),D5,G
109 GET(205,120)-(255,150),E5,G
110 SCREEN1,G
111 GET(5,150)-(55,180),A6,G
112 GET(155,150)-(105,180),B6,G
113 GET(155,150)-(155,180),C6,G
114 GET(155,150)-(205,180),D6,G
115 GET(205,150)-(255,180),E6,G
116 REM MOVE THE BLOCKS
117 X1=5:Y1=0:X2=5:Y2=0
118 F=-1:FORP=1 TO 4
119 Q=AND(2):GOTO134
120 NEXT P2
121 IF Q=0 THEN THEN Q=1
122 REM MOVE THE BLOCKS AGAIN
123 FOR P=1 TOQ=0
124 Q=AND(4)
125 GOTO134
126 NEXT P
127 K=0
128 REM KEYBOARD COMMANDS
129 AH=INKEY:IF AH="" THEN129
130 IF AH="/" THEN GOTO185
131 K=K+1
132 IF ASC(AH)=8 THEN Q=1 ELSE IF
ASC(AH)=94 THEN Q=2 ELSE IF ASC(AH
)=9 THEN Q=3 ELSE Q=4
133 GOTO180,1
134 ON Q GOTO 136,137,138,139
135 GOTO 129
136 IF X=1=0 AND P<Q=0 THEN 126
ELSE IF X=1=0 AND P=Q=0 THEN129 EL
E X=X+1:GOTO140
137 IF Y=1=0 AND P<Q=0 THEN126 EL
SE IF Y=1=0 AND P=Q=0 THEN129 EL
E Y=Y+1:GOTO140
138 IF X=1=0 AND P<Q=0 THEN126
ELSE IF X=1=0 AND P=Q=0 THEN 1
29 ELSE X=X+1:GOTO140
139 IF Y=1=0 AND P<Q=0 THEN 126 E
LSE IF Y=1=0 AND P=Q=0 THEN 129
ELSE Y=Y+1:GOTO140
140 X2=X+50+5:Y2=Y+30+5:Y2=Y1+
1+30+Y2=Y1+30+5: A(X,Y)=A(X,Y)+GOSU
B 140,140,147,140,147,150,151,152,
153,154,155,156,157,158,159,160,16
1,162,163,164,165,166,167,168,169,
170,171,172,173
141 IF P<Q THEN K=Q+1:GOTO120
142 IF P<Q=0 THEN K=Q+1:GOTO126
143 IF X=5 AND Y=5 GOTO 174 ELSE 1
29
144 PUT(140+45,(Y+1)+30)=(X+50+5,
P+30),B6,PSET:G1(1,Y1)=A(X,Y)+A(X,
Y)+50:Y1=Y2:Y1=Y:GOTO141
145 PUT(12,Y2)-(13,Y3),A1,PSET:GOT
O144
146 PUT(X2,Y2)-(X3,Y3),B1,PSET:GOT
O144
147 PUT(X2,Y2)-(X3,Y3),C1,PSET:GOT
O144
148 PUT(X2,Y2)-(X3,Y3),D1,PSET:GOT
O144
149 PUT(X2,Y2)-(X3,Y3),E1,PSET:GOT
O144
150 PUT(X2,Y2)-(X3,Y3),A2,PSET:GOT
O144
151 PUT(X2,Y2)-(X3,Y3),B2,PSET:GOT
O144
152 PUT(X2,Y2)-(X3,Y3),C2,PSET:GOT
O144
153 PUT(X2,Y2)-(X3,Y3),D2,PSET:GOT
O144
154 PUT(X2,Y2)-(X3,Y3),E2,PSET:GOT
O144

```

Continued on page 31







```

155 PUT(X2,Y2)-(X3,Y3),A3,PSET:GOT
Q144
156 PUT(X2,Y2)-(X3,Y3),B3,PSET:GOT
Q144
157 PUT(X2,Y2)-(X3,Y3),C3,PSET:GOT
Q144
158 PUT(X2,Y2)-(X3,Y3),D3,PSET:GOT
Q144
159 PUT(X2,Y2)-(X3,Y3),E3,PSET:GOT
Q144
160 PUT(X2,Y2)-(X3,Y3),A4,PSET:GOT
Q144
161 PUT(X2,Y2)-(X3,Y3),B4,PSET:GOT
Q144
162 PUT(X2,Y2)-(X3,Y3),C4,PSET:GOT
Q144
163 PUT(X2,Y2)-(X3,Y3),D4,PSET:GOT
Q144
164 PUT(X2,Y2)-(X3,Y3),E4,PSET:GOT
Q144
165 PUT(X2,Y2)-(X3,Y3),A5,PSET:GOT
Q144
166 PUT(X2,Y2)-(X3,Y3),B5,PSET:GOT
Q144
167 PUT(X2,Y2)-(X3,Y3),C5,PSET:GOT
Q144
168 PUT(X2,Y2)-(X3,Y3),D5,PSET:GOT
Q144
169 PUT(X2,Y2)-(X3,Y3),E5,PSET:GOT
Q144
170 PUT(X2,Y2)-(X3,Y3),A5,PSET:GOT
Q144
171 PUT(X2,Y2)-(X3,Y3),B5,PSET:GOT
Q144
172 PUT(X2,Y2)-(X3,Y3),C5,PSET:GOT
Q144
173 PUT(X2,Y2)-(X3,Y3),D5,PSET:GOT
Q144
174 REM CHECK IF DONE
175 FOR S=1 TO 5:FOR R=1 TO 5
176 IF A(R,S)=REP OR S=5 THEN NEXT R
177 ELSE 129
178 CLS:PRINT @ 265,"*** DONE ***"
179
179 FOR S=1 TO 10
179 SCREEN1,ON SCREEN 120,2 :SCREEN
0,1:GOTO 120,2:END
180 CLS:PRINT@129,"DONE IN:1:1:HOW
IS THE COMPUTER MADE?2:1:1
"HAFFLE?3:IF S&7="7" THEN PRINT @
265,"END FOR A NAME 4:4: ELSE PRINT
1809,"AGAIN Y/N"
181 S&8="":GOTO 129
182 IF INKEY#0 THEN 183 THEN 182
183 IF INKEY#0 THEN GOTO 184
184 CLS:GOTO 1
185 PRINT 3,5:GOTO 1
186 FOR S=1 TO 5:FOR R=1 TO
5:PRINT 3,1:SCREEN1,0
187 PRINT 3,1:SCREEN1,0
188 GOTO 129

```

## Rotator

From Neil Blagden's in North

MY PROGRAM for the Dragon 32 is a three-dimensional rotator, showing the principle of rotating a symmetrical shape in three dimensions.

It is not a real rotator as two points

remain fixed, however, it looks as if the whole shape is rotating. You are given the option of rotating a cube or a pyramid.

I use POLS instead of PPO for plotting each line, as when clearing many lines, POLS is faster and therefore gives a smoother display, rather than clearing each line separately. The speed-up pole (POKE 46848,0) is used in lines 180 and 181. If your Dragon crashes when these are

used, simply delete these two lines. Though the graphics are not as fast or as smooth.

### Program notes

10-140	Title Screen
150-165	Instructions
166	Input cube or pyramid
167-170	Drawing and rotation of cube

```

10 *****
20 ***3D ROTATOR**
30 ***N. BLAGDEN***
40 *****
50 TITLE
60 CLS
70 L=END(16)+1*16
80 PRINT@44,CHR$(140+L)+CHR$(140+L)
+CHR$(141+L)+CHR$(128)+CHR$(142+L)
+CHR$(140+L)+CHR$(137+L);
90 C=END(33)+16
100 PRINT@76,CHR$(140+L)+CHR$(140+L)
+CHR$(141+L)+CHR$(128)+CHR$(138+L)
+CHR$(128)+CHR$(133+L);
110 PRINT@72+36,CHR$(131+L)+CHR$(131+L)
+CHR$(133+L)+CHR$(128)+CHR$(139+L)
+CHR$(131+L)+CHR$(134+L);
120 PRINT@172,"rotator";
130 PRINT@172+64,"any"+CHR$(128)+"
key";
140 IF INKEY="" THEN 70

```

```

150 CLS:PRINT" 3D ROTATOR IS
A THREE DIMENSIONAL SIMULATI
ON OF A SPINNING CUBE OR
PYRAMID (DEPENDS ON WHICH YOU W
ILL ENTER)YOU CAN START AND S
TOP ROTATION USING THE SPACE BAR,S
O IF YOU PRESS THE SPACE"
160 PRINT@426,"ANY KEY"
170 IF INKEY="" THEN 170
180 CLS
190 PRINT@500 ONCE,AND THEREAFTER
TWICE QUICKLY,IT IS POSSIBLE TO
CLICK THE MOVEMENT THROUGH EACH FR
AME SEPARATELY;IF YOU PRESS C WHILE
E THE PYRAMID IS ROTATING ,IT WILL
SWAP TO A CUBE,AND IF YOU PRESS F
WHILE THE CUBE IS ROTATING IT W
ILL SWAP TO"
200 PRINT@241,"A PYRAMID"
210 PRINT@426,"ANY KEY"
230 IF INKEY="" THEN 230

```

Continued on  
page 10



# DRAGON 32

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```

340 INPUT CUBE OR PYRAMID
350 CLS:PRINT#70,"CUBE OR PYRAMID"
360 INPUT A$:IF LEFT$(A$,1)="" THEN
370 CLS:PRINT#77,"CUBE":FOR I=0 TO 90
380 NEXT I:GOTO520ELSE CLS:PRINT#75,"P
390 YRAMID":FOR I=0 TO 90:NEXT
400 P=0:R=150:Q=90
410 P=0:R=150:Q=90
420 L=0
430 "PYRAMID
440 LINE (150,50)-(120,70),PSET
450 J=70:R=150:Q=90
460 LINE (150,50)-(180,70),PSET
470 DRAW"OH120,70;R=0"
480 FOR P=120 TO 180 STEP2
490 IF INKEY="" THEN GOTO
500 LINE (150,50)-(120,70),PSET
510 DRAWING & ROTATION
520 LINE (150,50)-(180,70),PSET
530 LINE (180,70)-(0,0),PSET
540 LINE (120,70)-(0,0),PSET
550 LINE (150,50)-(0,0),PSET
560 LINE (150,50)-(180,70),PSET
570 LINE (180,70)-(0,0),PSET
580 LINE (120,70)-(0,0),PSET
590 LINE (0,0)-(180,70),PSET
600 LINE (150,50)-(0,0),PSET
610 IF P<150 THEN Q=Q+1 ELSE Q=Q-1
620 R=R-2
630 IF P<150 THEN J=J-1 ELSE J=J+1
640 LINE (120,70)-(0,0),PSET
650 LINE (180,70)-(0,0),PSET
660 LINE (150,50)-(0,0),PSET
670 IF INKEY="" THEN GOTO1323 THEN 480 ELSE
680 GOTO
690 IF INKEY="" THEN GOTO1323 THEN 480 ELSE
700 GOTO
710 NEXT
720 GOTO540

```

## Keybeep

From Stephen Young in *Issue 1*

This (SeeD) machine code program is in response to P A Morris request (Dragon Answers, May) for a routine to activate/deactivate the keyboard routine.

It works by diverting the character feed routine located at 500F7 to a short routine which checks to find if the characters from the feed routine are either RS — keyboard, or RD — keyout. If so, the routine acts accordingly by turning the beep routine on or off.

If the characters from the feed routine are not RS or RD, then they are passed on to the Basic interpreter to be executed normally. As the original keyboard routine remains unchanged in the same location as for G D Snooks' original contribution, it is probably best to reinsert the warning to disconnect a printer if you have one before activating the program.

Dragon Users with the original contribution on tape (Dragon User, Open File, October 1984) should be able to save some typing, although the complete program is listed here for ease of entry. Once the program has been entered, it can be saved as a machine code file:

```
SAVE#0 "KEYBEOP",500F7,500F71
```

A small amount of space should be

cleared after loading, that is CLEAR 200, 500F70 before the program can be called using EXEC 500F71. This only needs to

be done once after loading and from then on your Dragon has increased its vocabulary by two words.

```

10 .....
20 KEYBEOP
30 BE: II
40 .....
50 CLEAR 200,500F70
60 DATA B6,B9,B7,01,6C,B6,7E,B7
70 DATA 00,AB,B6,7F,B7,00,B7,B6
80 DATA B6,B7,00,AB,39,01,4B,26
90 DATA 1C,BC,AB,C3,00,01,0B,AB
100 DATA B6,7F,0B,AB,B3,53,27,19
110 DATA B1,51,27,14,1C,AB,B3,00
120 DATA 01,0D,AB,B6,4B,7E,BB,26
130 DATA CC,7E,7F,FB,01,AB,0E,7F
140 DATA CC,39,7F,FB,01,AB,0E,7F
150 DATA 34,36,0E,00,01,10,0E,00
160 DATA 01,30,01,AB,59,B7,7F,20
170 DATA 7F,01,12,7F,01,13,AB,7F
180 DATA 23,BA,0B,B7,7F,23,AB,7F
190 DATA 01,04,77,B7,7F,01,AB,7F
200 DATA 03,04,77,B7,7F,03,73,7F
210 DATA 20,34,10,30,1F,24,7C,35
220 DATA 10,10,1C,01,12,2D,EF,1C
230 DATA 00,70,26,CB,35,34,39
240 FOR N=500F71 TO 500F7F
250 READ A$:FOR E=N,VAL ("MH"+A$):RE
260 EXEC 500F71

```



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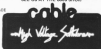
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# Bookbytes

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1215 Little Newport Street, London WC2R  
2LD.

**Book:** *Training Your Dragon*  
**Authors:** Richard Collins and  
John Sharp  
**Publisher:** Prentice-Hall International  
**Price:** £7.95

It is unfortunately true that most computer manuals leave a lot to be desired. This is not always the writer's fault, as he/she often has to use a prototype machine that is nothing like the finished article. Manufacturers are notorious for their changes, both up to and beyond the launch of the new computer. This provides other authors with the opportunity to delve into different aspects of the machine that the manual has failed to cover.

The *Dragon* has been better than most in not entering its configurations, but the manual itself seems in for a certain amount of criticism at the launch in not providing enough clear explanation for the first-time user. *Training Your Dragon* aims to help the beginner get to grips with his machine although there are experienced users may like the detailed explanations of some of the features.



In 25 chapters, the book ranges from beginner's basic, through graphics and sound up to a brief explanation of machine code. There are many short programs scattered through the text to explain particular points, and the occasional diagram to illustrate the text. The style is friendly, if rather verbose, but has a tendency to become rather wordy in places.

The chapter on editing is well presented and will encourage any reader to spend

more time on learning to use what is one of the *Dragon's* finer points. Many users never become familiar with some of the editing commands which are well worth the trouble of learning.

Another part of the book I particularly liked was the large section dealing with graphics techniques. These are eight chapters on this subject and in some ways there is too much detail here. The novice is likely to find it rather overwhelming, as you have to read pages and pages of text before you actually discover how to do anything. For someone who has spent some months puzzling over the manual, however, it is picked just about right. You will find new ideas that are not available elsewhere, but you do have the advantage of having them all together in one volume.

I am surprised to see this book appears so long after the launch of the *Dragon*, and in some ways the publishers have probably left it too late for this book to sell well, which is a pity as it is obviously the result of some hard and careful work. If you are new to the *Dragon* and can't find a copy of *Going Ahead With Colour Basic* from your local Tandy shop, still my favourite introductory *Dragon/Colour Computer* book then you could do worse than buy *Training Your Dragon*.

John Squires

**Book:** *Exploring Adventures on the Dragon*  
**Author:** Peter Gerard  
**Publisher:** Gower  
**Price:** £8.95

PETER GERARD, author of several books on the Commodore computers, has now turned his attention to the *Dragon* with this book for would-be adventure game programmers. The book betrays its Commodore origins in places, with references to the desirability of using lower-case text and selection of screen and border colours, both unavailable on the *Dragon*, but the program listings have fortunately been edited more thoroughly than the text, and should run satisfactorily on the *Dragon* if you have the energy to type them in. If you don't

you will be relieved to know that a cassette version is available.



Three complete adventure games, all written in Basic to the same format, are provided, and there is a line-by-line explanation of one of the listings. The idea is that a careful study of the listing should enable you to write your own games along similar lines. The author has thoughtfully provided some skeleton plots as well, for those readers whose programming skill exceeds their inventiveness.

The book also contains a section on the history and development of adventure games, with detailed descriptions of the original *Adventure* and some of the *Scott Adams* adventures (not, as far as I know, available on the *Dragon*) and a rather unnecessary section on elementary programming.

It's by no means the worst computer book I've seen, but you'd be better to spend your money on a subscription to an adventure magazine.

Margaret Norman

**Book:** *6809 Machine Code Programming*  
**Author:** David Barrow  
**Publisher:** Granada  
**Price:** £7.95

THERE IS no shortage of books about machine code on the *Dragon*—some are good, some are bad, *6809 Machine Code Programming* by David Barrow is, despite its unoriginal title, one of the better ones.

The book starts off assum-

ing no previous knowledge of machine code and tries to eliminate some of the myths which surround this language. Chapter 1 is rather badly entitled "How to Write machine code programs", as David introduces the principles of structured programming, including flow charts, documentation and debugging.

*6809 Machine Code Programming* is designed principally to be a collection of program subroutines which are both useful and also serve to introduce the concepts of programming in the computer's native language. Subsequent chapters deal with number crunching, the *Dragon's* support chips, high resolution graphics and sound. Particularly interesting is chapter seven, which includes a program to display full upper and lowercase characters on the hires screen.



DAVID BARROW

All of the routines are excellently documented and much useful information can be found within them for the novice. Although some technical information is given, it would have been nice to see a decent memory map, and perhaps a list of useful ROM routines.

There are a number of useful appendices covering *6809* architecture and assemblies. If you're looking for a book on *6809* machine code with references to the *Dragon* then this is worth considering. What it lacks in technical information, it makes up for in its general approach.

Dorian Cudger







## Perfect harmony

I HAVE noticed on some of my games tapes that the accompanying music is played in harmony (that is, more than one note at a time).

I have never seen any information on how this is achieved and would be most grateful if you could enlighten me.

J W Robinson  
Drimmagan  
Chesham

THIS type of music is only available by using machine code routines which are not particularly easy to write. A program called "The Composer" is available from Microdeal which allows you to enter music in two voices in simple note form. The program will then create a machine code routine which you can save and use in your own Basic programs.

Composer costs £15 and is available from Microdeal at 41 Truro Road, St Austell, Cornwall, PL23 3JL.

## Connect a cassette

IS IT possible to connect an ordinary cassette microphone (with cassette jack-plug) to the joystick port of the Dragon 32? If so, which pin should I connect the two halves of the jack-plug to? I hope to use the microphone input in a speech-recognition program, by reading the value of the joystick port from Machine Code.

Damon Cocking  
Country  
West Midlands

THE short answer is NO. The joystick ports are 5A devices which output voltage — this could damage your microphone and any other device you plug in. Joysticks, lightpens and so on give a resistance value which can be detected by the ROM routine which compares the voltage sent out to that coming back.

Now would be better to connect your microphone via an amplifier (such as a cassette recorder) to the tape socket on the Dragon.



## Making more memory

I HAVE just recently purchased a Dragon Data disk drive and found out that because the disk cartridge takes up the first page of graphics memory, I could not get some of my programs to either load or run.

This is very annoying as every time I want to load my favourite game, I have to take out the disk cartridge. Are there any machine code routines or tricks that I may enter before loading?

Gandy Moore  
Liverpool

IT IS possible to "unplug" the disk cartridge by using software, so the computer thinks it isn't there. The program to do this is too long to list here, but is fairly simple to write given the following information.

You need to copy the Basic boot program from ROM to RAM, this starts at address 40000. You then need to change this up so that it doesn't check for the disk cartridge (it does this by looking to see whether the first two bytes at 40162/3 are 087). Finally you need to manually set the top of memory pointers and rerun your modified bootup program in RAM.

To return to the dos, simply type POKE 112,0 and press reset.

## Graph equation

I HAVE owned my Dragon 32 for some months now and have been buying your magazine Dragon User. In it, I have seen, on an

advertisement for a printer, a graph drawn.

I would like to be able to enter an equation and have it plotted on a graph. Please can you show me a program that will do this.

Percy Stewart

THE functions SIN, COS, and TAN are useful for drawing the type of graphs you describe. The particular graph shown in the advert you refer to is a simple sine graph, which can be drawn with the following short program:

```
10 MODE 4.1 : COLOR 0.1 :
   PCUR : SCREEN 1.1
20 FOR X = 0 TO 255
30 Y = SIN(0.058+0.262)+40
   +50
40 PLOT(X,Y):NEXT X
50 GOTO 50
```

## Print m/c numbers

I HAVE two problems I would like to ask you.

- 1) How do you achieve CLABD and CLABDM in machine code?
- 2) How do you print numbers in machine code as J28 44-45/46 only prints a letter?

David Hedley  
Norfolk

TO access CLABDM set up the firmware in loc. 474-487, then LDR instruction adds to prog.

```
PORG X
LDR -start of data
STX 487
LDR -end of data
PORG X
LDR -entry addr
PORG X
STX 485
JMP 58195
```

TO access CLABDM use J28 41180.

To print a 16 bit number in the 'B' register to the screen use: CLB 171

J28 30290  
and to the printer use:  
LDR #254  
STX 171  
J28 30290

## Tandy interface

I HAVE had a Dragon 32 for about one and a half years and am thinking of buying a Tandy TP-10 printer, but have heard that it is incompatible.

Can I modify this printer to work with the Dragon, and if so, can you show me the connections between a five-pin pin plug and a parallel plug. I would like to make my own lead as ready-made leads are expensive.

Nicky Allard  
West Midlands

THE Tandy TP-10 is not compatible with the Dragon as it has only a serial interface and the Dragon requires a parallel interface. It is certainly not possible to connect the two directly and as far as I know there is no interface available to do this. The printer is designed only to be used with the Tandy Case.

## VARPTR and USR

PLEASE tell me how to call machine code routines, how a Basic program using VARPTR and USR?

Also, could you explain VARPTR, how it is used and what it is used for.

Richard Craig  
Bathurst

THE USR command can be used when your machine code routine needs to pass values to and from Basic. If your routine starts at address 30000, then the USR address is set up as follows: VARPTR 30000

To call your routine and pass a variable to it use:  
X = USR05 (VARPTR(X)) (Dragon 32)

X = USR5 (VARPTR(X)) (Dragon 64)

VARPTR returns a 16 bit address of the variable pointer, this can be returned in the B register if your program uses J28 58223. Then STX will be the length of the string X, and (B+2) will be the address of the start of the string.







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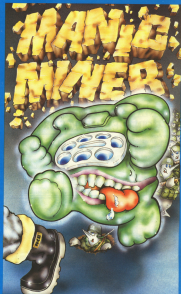
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When Willy, while prospecting through Scotland, saw a massive system of caverns, long forgotten, underneath the surface, he made estimates of a best utilisation for the space for his own, which meant utilising it to dig deep into the earth's core to supply the essential raw materials for the advanced technology. After centuries of peace and prosperity, the civilisation was torn apart by war, and legend tells of long dark ages, when following their industry and machines. Nobody, however, thought to let the mine itself do sleep work, and through centuries more they had gradually accumulated a huge stockpile of valuable metals and minerals, and when Willy realised that the mine has the opportunity to make his fortune by finding the underground riches, he tried to mine in the next centuries, you must collect all the floating layers in the mine while avoiding warlike (but) Perseus, Furies and Spiders and Miss (and more) of all. Make Money Robots. When you have all the keys, you can enter the gold which will win the fortune. The game ends when you have found 'got' or follow heavily these lines.



Available on the Dragon 32/64

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AFTER LAST month's goodies, with *The Hulk* and the first in the *Mysterious Adventures* series, it's rather a quiet time, which should at least be good news for everyone's pockets. If you do have money to spend, though, then Channel 4 continues to churn out *Dragon* conversions of the *Mysterious Adventures*, of which there will be 11 in total, and at £16 a time it makes you glad to be a reviewer.

I had been hoping to run through the *Mysterious Adventures* in order, but they are arriving rather haphazardly, the most recent to turn up being their latest title, *Waxworks* (number 11). Before that, however, I had an opportunity to look at number five in the series, *Feasibility Experiment* — not a Brian Howard solo this time, but written jointly with Warner Barnes. The format is the same for all the series I've seen so far: a text-only CD version and a graphics-led version on the same tape, a pleasantly re-defined character set, with the top quarter of the screen taking care of the description, visible objects and exits, and your commands and the responses scrolling up in the bottom three-quarters of the screen.

### Feasibility

From the start it would seem that *Feasibility Experiment* is a solid type of story: "Far beyond the outermost Galaxy of our universe, beyond the wildest imaginings of mortal man lies a newly born World." It has been built by beings who have no physical form but are merely clouds of pure mental energy. So where does Fred Boggis, turn-of-the-century owner from Stoke Poges come into this?

It seems things have gone wrong on this world and they need a Superhero from Earth as a sustaining life force, and you have been whisked away to wake up in an odd mansion, not realising you are undergoing the experiment of the title to see if you are a worthy Superhero. Come on Fred, you can do it! You have 700 turns, with a soft voice regularly whispering how many you have left.

Going East takes you into a Viewing Room, through the window of which you can see a pride of lions. Furry, I thought. A little further on I wandered down a tunnel and came out in an arena where a lion proceeded to rip the agent apart. Not so furry, I thought. The sword I had found didn't seem to have much effect on the ravenous lion,

but after a wander round a maze of tunnels I found a means of defence enabling me to get safely through the arena, when I found myself in the Emperor's Box — I made a polite enquiry and was attacked by his guards. Charming.

Traveling the other way leads to grassy plains and mountain paths with several objects, including the odd treasure, which is what you are looking for. Collecting the treasures proves your heroic qualities. The standard of this series is fairly consistent as regards toughness, and also as regards the fairly terse descriptions: "I'm in a weapons room," and "I'm in a tunnel" and so on. *Feasibility Experiment* didn't appeal to me as much as some of the others because of its rather disjointed nature, although this is part of the overall idea. If you like the series, however, then it shouldn't disappoint.



Protestable for me was the new title, *Waxworks*. Here, you wake up in the leisure lounge of a deserted waxworks. Moral: if you want to stay out of trouble, don't fall asleep. You always wake up somewhere strange. This place is even stranger as you're not told what you're meant to be doing. The cassette comes with a leaflet giving you the outlines for the first 10 adventures in the series, but not the eleventh. No wonder they call them *Mysterions*.

All that the first screen tells you is "I remember coming to the Waxworks . . . I

must have slept. The place is dark! It's spooky! What now?" What indeed? Well you can start by examining the wooden beams, the public telephone, the old fashioned slot machine and the seating around the leisure room, before wandering off to check out the exhibits of the Grand Hall. This must be the first adventure where you can utilise the command EXAMINE JACQUES COUSTEAU.

### Scuba Gear

In front of this exhibit you're asked a riddle, and though I've given the right answer it doesn't seem to have done me much good yet . . . I couldn't persuade old Jacques to hand over his scuba gear, which would surely come in handy in the large aquarium tank where you come to grief in the teeth of Jaws IV. There's another exhibit covering the ascent of Everest, and other features include a series of old sewers full of rats, a haunted rat-trap, but no visible means of escape, and a maze in the Hall of Mirrors which needs to be thoroughly tested and investigated as it leads to more than one place. *Waxworks* might be a bit more expensive than a visit to Madame Tussaud's, but I can guarantee it's last longer.

Finally this month a query from a reader who recently bought the graphics version of *Callisto Island* from *Dragon Data*. Alan Gayer of London SW9 says that he loves the graphics, but unfortunately can't get out of the first few locations. He read in a review that the adventure opens up when you make your way to Professor Legard's secret laboratory, but the laboratory's proving a little too secretive for Alan. This is one of those occasions where looking once at an object is not enough, you have to look twice. And if you want a clue as to which object, all I'll say is that Mrs Thatcher's got one.

If other readers have any queries then I'll try to help if I can, and in the spirit of mutual co-operation that seems to exist amongst adventurers, if anyone out there has completed *Madness* and the *Minotaur* I'd be glad if they could spare a minute or two to write to me. ■

Each month Mike Gerrard will be taking all adventures for the *Dragon*. If you have an adventure you want reviewed or you need advice or have some to offer write to Mike Gerrard's Adventure Trail at *Dragon User*.



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Please continue on a separate sheet if space

I make this..... words, at 30p per word so I enclose.....

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Please cut out and send this form to: Classified Department, Dragon User, 12-13 Little Newport Street, London WC2R 3LD



# Competition Corner

Answers to Competition Corner,  
Dragon User, 12112 Little Newport  
Street, London WC8N 8LD



## Counting counters

Melbourne House provides the prizes to  
Gordon Lee's historic puzzle

THERE MUST be many of us, I'm sure, that have sat up late into the night with a tricky program on our Dragons, and who have found that on finally going to bed, sleep is denied us as the problem persists, in going round and round in our brains. If you have been so affected you may be surprised to hear that a similar problem was not unknown to one of the most well known figures in English literature just a century ago. That person was Lewis Carroll, and I hasten to add that it was not

### Prize

MELBOURNE HOUSE is offering 30 readers a chance to win a copy of its sequel to *Hungry Horace*, *Horace Hides Being* (published in the September issue of *Dragon User*).

### Rules

THERE WERE TWO winners chosen from amongst the many entrants to the August Competition. The first prize winner is Adrian Forsman from Wiltshire (who is the recipient of a £20000 dual disk drive system from Compaq). Second prize, the single disk equivalent, the £10000, has been won by Thom Jervis of Scotland in Derby.

Both winners sincerely stated that the 40000 word was 400 to 10000 the message "CHECK THIS ON YOUR COMPUTER AND YOU MAY WIN THIS MONTH'S DRAGON USER COMPETITION."

### August winners

TO WIN a copy of the game you must show both the answer to the competition and how to solve it with the use of a Basic program developed on your Dragon. Please do not send in a message containing the answer. As a tie-breaker complete the following sentence in 15 words or less: "I want to own a copy of *Horace Hides Being* because..."

Your entry must arrive at *Dragon User* by the last working day of November. The winners and the actual list of the quiz will be published in our February issue. Entries will not be acknowledged and we cannot enter into correspondence on the result. You may only enter the competition once.



computer problems that were the cause of his insomnia, but mathematical notions of a more general nature.

Lewis Carroll, the pen name under which the Reverend Charles Lutwidge Dodgson (published his immortal childrens' classics, was also the author of more academic works on formal logic and Euclidean geometry. However, it is probably for his creation of such characters as the Cheshire Cat, Queen of Hearts, Mock Turtle and the Mad Hatter and Carpenter that he will be best remembered.

### Photography

Educated at Rugby and Oxford, he entered Christ Church, Oxford in 1861 and was appointed lecturer in mathematics there in 1864. His other interests were in photography, that in its infancy, and in which he achieved a fair amount of notability and in the church — he was ordained a deacon in the Church of England in 1861.

In between the fantasy world of *Alice in Wonderland* — (just imagine what sort of computer adventures he could have written) — and his mathematical works, he created a number of interesting collections of puzzles and diversions. These he assures us in the preface to the first edition of his *Pillow Problems*, were thought out while lying awake at night. Indeed, appended to many of the puzzles in this collection are the actual dates on which

they were devised. For instance, on 8 September 1867 he invented the following curious problem:

"A bag contains two counters, as to which nothing is known except that each is either black or white. Ascertain their colours without taking them out of the bag."

He then proceeds, by a convoluted process of logic, to show that the bag must contain one black and one white counter. Perhaps this strange logic is to be expected from the creator of *Alice's Adventures in Wonderland*!

"Take some more tea," the March Hare said to Alice earnestly.

"I've had nothing yet," Alice replied in an offended tone. "So I can't take more."

"You mean you can't take less," said the Hatter. "It's very easy to take more than nothing."

For this month's competition we are reproducing one of Lewis Carroll's puzzles — dated 4 March, 1860. There are three bags, each containing six counters; one contains five white and one black, another, four white and two black; the third, three white and three black. From two of the bags (it is not known which) a counter is drawn (one from each), and which proves to be one black and one white. What is the chance of drawing a white counter from the remaining bag?

Assume that Lewis Carroll had a computer and show how he might have used it to solve this problem.



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